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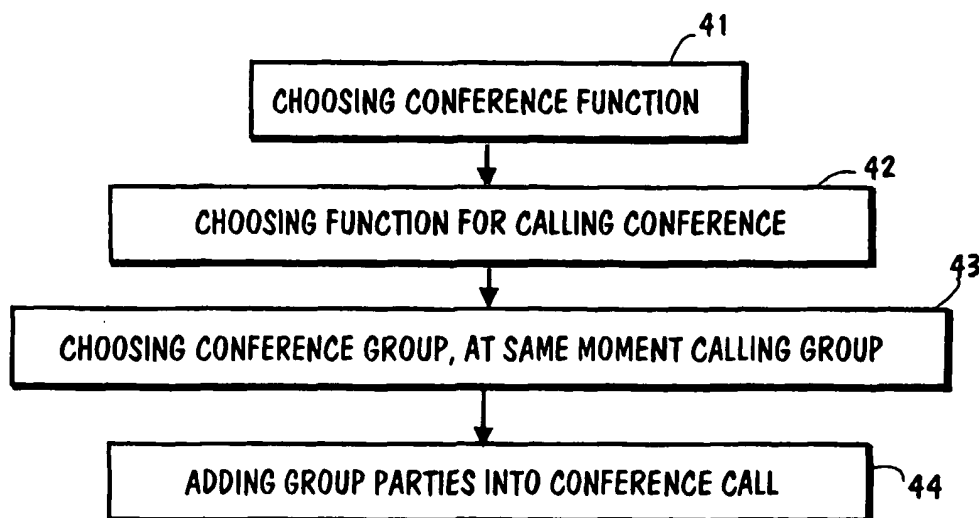
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(54) Title: **CONFERENCE CALL SYSTEM**



(57) Abstract: This invention relates to telephone systems, which offer conference call function. The invention provides a user-friendly way for setting up a conference call. The originating party of the conference call chooses a conference call function in his telephone for calling the conference. In the phone of the originating party there are predetermined groups for making a conference call. The originating party selects the group desired, and calls the group. The arrangement, which handles the conference call, sets up the conference automatically. It calls each terminating party, and bridges them to the conference.

Conference Call System

Field of the Invention

This invention relates to telephone systems, which offer conference call function. Especially, the invention provides a conference call system and method that is capable of setting up conference calls automatically.

Background of the Invention

A conference call is a telephone call in which at least three parties participate. The most common way to arrange a conference call is that the originating party handles all tasks, i.e. dials each terminating party. Figure 2 illustrates an example of steps needed when making such a conference call in terms of present state of art.

The originating party dials 21 the phone number of the first terminating party. Alternatively the originating party can just select the name or the phone number of the first terminating party if the terminal, such as a mobile terminal, has the name and the phone number in its memory. Naturally, the next phase is to call 22 first terminating party. If the first terminating party does not answer, the originating party selects 24 another terminating party to be first. If the first terminating party answers 23, the originating party holds 25 him/her on the line, and selects 26 next terminating party.

The originating party then calls 27 the next terminating party. If the next terminating party does not answer, the originating party selects 29 another terminating party to be the next terminating party. If the next terminating party answers 28, the originating party forms 210 conference call by bridging (connecting) him/her to the joint line. If the terminating party is not the last party, the originating party holds the conference call 25 and selects 26 a new terminating party to be next terminating party. If the terminating party is the last party 211 to be called, the conference call is ready 212.

Another way of making a conference call is to use conference call service provided by an operator. An originating party makes a conference call service request, and determines the starting time, estimated length of the conference call and other information relating the call, including the number of parties and their phone numbers, if a conference secretary is desired to call the parties, and other matters, such as the invoicing address. The parties get a conference number whereto they call at the conference time, or the

secretary can make a reminder call to each party or make the conference by calling and bridging each party to the conference.

As can be noticed, the present solutions comprise many phases for setting up a conference call. In the solution of calling each terminating party, an originating party goes through several phases while initiating the conference call, which is tedious. If the originating party uses an operator-provided conference call service, the exact time of the conference must be distributed to each party beforehand, and advance work is required for setting up the conference.

The goal of the invention is to eliminate these drawbacks existing in the present state of art. This is achieved in with an arrangement described in the claims.

Summary of the Invention

To overcome limitations in the prior art described above, and to overcome other limitations that will become apparent upon reading and understanding the present specification, the present invention discloses a system, apparatus and method for conference call communication services to a wireless terminal operating within a wireless network. The wireless device is not limited to any preset navigation structure, and provides the ability to remotely access conference call services.

The invention provides a user-friendly way for setting up a conference call. The originating party of the conference call chooses a conference call function in his telephone for calling the conference. In the phone of the originating party there are predetermined groups for making a conference call. The originating party selects the group desired, and calls the group. The arrangement, which handles the conference call, sets up the conference automatically. It calls each terminating party, and bridges them to the conference. The originating party just calls once, the group.

The originating party must create the conference groups beforehand. The groups are easy to maintain. The originating party can easily modify or delete the groups. It is very convenient to form several groups for different social needs.

Brief Description of the Drawings

In the following the invention is described in more detail by means of Figures 1 - 7 in the attached drawings where.

- 5 Figure 1 illustrates an example of a mobile network comprising a conference call system,
Figure 2 illustrates an example of a present method for setting up a conference call, in a flow chart,
Figure 3 illustrates an example of the method according to one embodiment
10 of the invention for creating a conference group, in a flow chart,
Figure 4 illustrates an example of the method according to one embodiment of the invention for setting up a conference call, in a flow chart,
Figure 5 illustrates an example of the last phase in Figure 4 for bridging all terminating parties automatically to the conference call, in a flow
15 chart,
Figure 6 illustrates displays of a mobile phone in different phases when a conference group is created, and
Figure 7 illustrates displays of a mobile phone in different phases when a conference for a specific group is called.

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Detailed Description of the Invention

In the following description of the various embodiments, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration various embodiments in which the invention may be practiced. It is to be understood that other embodiments may
25 be utilized, and structural and functional modifications may be made without departing from the scope of the present invention.

Figure 1 shows an example of a mobile network, which is provided with a conference call service system CC 1 according to one embodiment of
30 the present invention. The CC handles signal information concerning holding and conference functions (compare Figure 2) when an originating party is making a conference call. According to signals received from the phone terminal of the originating party, the CC holds parties on the line and bridges (connects) new members to the conference call by controlling the cross-
35 connection field 3 in a MSC (mobile switching center) 2. The MSC is connected to several base station controllers BSC, in this case to two BSCs 7A,

7B, which are, in turn, connected to several base stations BTS, in this case BTS1 through BTS3 to the first BSC 7A, and BTS4 and BTS 5 to the other BSC 7B. Mobile terminals (MS1 through MS7) are each in a radio-way connection with the nearest base station. The MSC is also connected to a visitor location register VLR 5 which temporally saves subscriber data of visiting mobile terminals in operator network, and to a home location register (HLR), which maintains subscriber data of subscriber mobiles terminals of the operator network. The MSC is also connected to a gateway mobile services switching center GMSC 6, through which it is possible to form connections to PSTN, ISDN or IN (intelligent network) networks. The MSC can also be connected to a WAP gateway 8, through which it is possible to connect via Internet 9 other terminals or services.

The network in Figure 1 contains plenty of other elements as well, but for the sake of simplicity, only the basic elements have been illustrated. It should also be clear that the invention is equally suitable for use in other types of networks, such as above-mentioned PSTN, ISDN and IN as well. The development of wireless networks leads to other systems, such as GPRS, 3G, EDGE etc. to name a few, The present invention can be utilized in these systems too.

Before a conference party according to the invention is possible to set up, a conference group must be created. A conference group is a group of people that have multilateral discussions of a topic while not necessary in the same location.

The creation phase according to the invention is illustrated in the examples of Figures 3 and 6. Figure 3 shows an example of the method according to one embodiment of the invention for creating a conference group, and Figure 6 shows a display of a mobile phone in different phases when a conference group is created. It should be mentioned that a terminal, such as a mobile phone, must have a memory unit for storing necessary information in order to store created conference group. The necessary contact information comprises at least phone numbers, but preferably names as well. It is also convenient that a phone has a display. Although, a mobile phone, like Nokia 7110 is especially suitable terminal for the use of the conference call according to the invention, and used in the examples of this text, another type of terminal is possible, such as a laptop, a personal digital assistant

(PDA) or a smart phone. The terminal must be equipped with connection and storing capabilities.

First, an originating party must choose (Figure 3, 31) a conference function on a mobile phone. This is done by browsing through the menu (Figure 6, 611) in the mobile phone display (Figure 6, 61), and choosing the conference function (Figure 6, 62). The conference function contains a menu, (Figure 6, 621) named in this example as a profile, in which the originating party can choose the function (mode) needed. The functions (modes) are "calling a conference", "creating a conference group", "modifying a conference group", and "deleting a conference group" (Figure 6, 63). It is clear that there can be other functions in this menu too, if needed. The profile menu contains a back function (Figure 6, 633) too. For creating a new conference group the originating party chooses (Figure 3, 32) the create function (Figure 6, 631). The conference function also contains an exit function (Figure 6, 622).

The create function comprises (Figure 6, 632) an "add" function (Figure 6, 642) and a "save" function (Figure 6, 643) in its display (Figure 6, 64). Although, Figure 6 shows the mobile display with names of persons in the memory of the mobile phone, the create function can as well show numbers in the memory of the mobile phone, or the create function can even comprise a function in which the originating party can write, i.e., enter, a phone number (and name) to the memory of the mobile phone. The originating party selects the persons to a conference group, such as Mr. Brown (641) in Figure 6, and uses the "add" function for adding (Figure 3, 33) the selected person into the group.

After the originating party has selected all parties (Figure 3, 34) to the conference group, the originating party must name, i.e., give an identification to the group, and save the group (Figure 6, 65). For getting into the naming phase, the originating party uses the "save" function (Figure 6, 643) (can be named otherwise) in the create phase. In this case, the originating party names the group as managers (Figure 6, 65). Finally, the originating party saves the named conference group (Figure 3, 35) by selecting the save function (Figure 6, 651) in the naming phase (Figure 6, 65). The originating party exits from the conference function using an exit function (Figure 6, 652).

The actual setting up for a conference call according to one embodiment of the present invention is illustrated in the examples of Figures 4

and 7. Figure 4 is an example of the method according to one embodiment of the invention for setting up a conference call, and Figure 7 shows display of a mobile phone in different phases when a conference for a specific group is called. I.e. the mobile phone is in the conference mode.

5 First, an originating party must choose (Figure 4, 41) a conference function in a mobile phone. This is done by browsing through the menu (Figure 7, 611) in the mobile phone display (Figure 7, 61), and choosing the conference function (Figure 7, 62). The conference function contains the above-mentioned profile menu (Figure 7, 621), in which the originating party
10 chooses (Figure 4, 42) the "call" function (Figure 7, 731) in the display (Figure 7, 73).

The "call" function (Figure 7, 732) comprises (Figure 7, 74) a "select" function (Figure 7, 742) and a "back" function (Figure 7, 743) in its display (Figure 7, 74). The display shows different conference groups, which the
15 originating party has created, such as friends, family, managers, and subordinates. In this case the originating party selects the manager group (Figure 7, 741). The selecting phase also contains a "back" function (Figure 7, 743) for going back to the previous phase.

By selecting (Figure 7, 742) a specific group, the conference call
20 arrangement automatically calls (Figure 4, 44) each member of the group, i.e. the terminating parties. In other words, in response to only a single action being performed, at least one request from originating party's terminal is sent to establish the conference call. The display of the mobile phone shows (Figure 7, 75) a message that the conference call is being set up (Figure 4, 44), i.e.
25 the conference call is established. In this phase, it is still possible to cancel the conference call (Figure 7, 751) or exit (Figure 7, 752) the conference call function for doing other tasks.

Figure 5 shows in more detail an example of a flow chart for describing the automatic phase of calling all terminating parties for bridging to
30 the conference (Figure 4, 44) according to one embodiment of the present invention. After the originating party has selected a specific group for calling to the conference, and at the same moment started the automatic performing of the conference call, the conference call arrangement signals a starting request from the mobile phone (Figure 1, MS1) to the CC (the conference call
35 element) (Figure 1, 1) It should be noticed that each owner of a mobile phone that is provided with this function of the inventive conference call, can be an

originating party, and form his/her own conference groups. So, in Figure 1 each mobile phone MS1 through MS7 can act as an originating terminal. It is also clear that the CC need not to be in the MCS, but it can be situated in another place, which is thought to be reasonable in the network.

5 The CC applies (Figure 5, 51) a ringback to the originating party, and calls to first terminating party. At the same time the CC starts (Figure 5, 52) a time-out countdown for the call of the first terminating party. If the first terminating party does not answer (Figure 5, 54), the time-out expires and the CC sends a signal to the originating terminal for calling a new terminating
10 party to be first for bridging to the conference call. Alternatively, the CC can get a VMBS (Voice Mail Box Signal) or NRCB (Not Reachable) signal from the terminal of the first terminating party, when the CC correspondingly sends a signal to the originating terminal for calling a new terminating party to be
15 first for bridging to the conference call. The VMBS signal means that the call is directed to the voice mailbox service, in which the originating party can leave a message to the terminating party. The NRCB signal means that the
terminating terminal is not reachable, for example, out of power or out of networks coverage area. Whatever the reason for the unanswered call, the unanswered calls are released (Figure 5, 56) out from the conference call.

20 If the first terminating party answers (Figure 5, 53), the CC closes (Figure 5, 55) the ringback, and bridges the terminating party to the conference call. The originating party and the first terminating party can start to talk with each other, meanwhile the CC calls (Figure 5, 57) to next terminating party, and starts the time-out countdown.

25 If the next terminating party does not answer (Figure 5, 59), the time-out expires, the CC then sends a signal to the originating terminal for calling a new terminating party to be next for bridging to the conference call. Alternatively, the CC can get a VMBS or NRCB signal from the terminal of the next terminating party, then the CC correspondingly sends a signal to the
30 originating terminal for calling a new terminating party to be next for bridging to the conference call. Whatever the reason for the unanswered call, the unanswered calls are released (Figure 5, 56) out from the conference call.

 If the next terminating party answers (Figure 5, 58), the CC applies (Figure 5, 510) a joining tone to the conference call, when the already
35 bridged conference parties know that a new party is joining the conference. The CC bridges (Figure 5, 511) the new terminating party to the conference

call. The new party can immediately start talking with the old parties of the conference. If the latest bridged terminating party is not the last party to be joined to the conference call, the CC calls (Figure 5, 57) a new terminating party to be the next one. If the latest bridged terminating party is (Figure 5, 512) the last party to be joined to the conference call, the conference call has been formed (figure 5, 513). If desired, it is possible to inform the originating party (and the other parties as well) that all parties have been joined to the conference call, for example, using a special tone for the expression.

It should be mentioned that in one solution for the embodiment of the invention, modification is needed only in a phone terminal. In this case, the phone terminal of the originating party calls each terminating party separately by single selection (so the alternative is that all the conference information separately to each called party is sent at the beginning of the conference call to the CC). So the signaling between the phone terminal and the CC remains the same as before. Consequently the use of the phone is made easier.

There may arise some problems with the inventive system if a terminating party uses a normal telephone answering machine connected to a standard phone. An answering machine does not send any response signal for indicating that the answering machine has answered the phone. So, the answering machine can record the conference as being a party in the conference.

To avoid this drawback, the method and arrangement according to one embodiment of the invention needs supplementary functions. A solution is to provide an option menu containing functions which are supposed to be needed during a conference call. The functions can be an "abort" function for disconnecting all parties, i.e, ending the conference call, an "add" function if the originating party desires to add a new party manually, and a "drop" function if the originating party desires to drop a specific party, such as an answering machine. In the case of the drop function, the display of a phone should present the parties of the conference. Preferably this option menu is valid only for the originating party of the conference call. It would be too confusing if all parties can add and drop parties as they desire. Nevertheless this alternative is possible, if desired.

Yet another solution for realizing the inventive arrangement is that some parts of the automatic functions are done manually. For example, the

originating party accepts and rejects each terminating party manually. In other words, phases 54, 56, 57, 59, and 511 are controlled by the originating party. This alternative solution is easier to realize than the preferable solution described in this text, but it is also more tedious for the originating party.

- 5 Naturally this realization needs more signaling between the originating terminal and the CC.

Because the CC can be situated practically anywhere in the network, each mobile phone can have its own CC. In this case, the CC handles only the conference call originated by the mobile phone itself. It is worth noting that the memory of the mobile phone should be large enough too.

10 The creation of a conference group can also be done just before making a conference call. So, it is possible to make a conference group manually, not using a predetermined group. This feature can be as an option for the forming of a conference group earlier.

15 As can be noticed, there exist plenty of solutions, which are realizable according to the invention. Thus, it is evident that the invention can be used in other solutions than described in this text, in the scope of the inventive idea.

Claims

1. A method for establishing a conference call between an originating party and at least two of a plurality of terminating parties in a telecommunications network, characterized in that the method comprises the steps of:
- displaying information on the originating party's terminal for identifying that the terminal is in a conference mode;
 - in response to only a single action being performed, sending at least one request from the originating party's terminal to establish the conference call between the originating party and the terminating parties defined as a group previously stored in a memory of the originating party's terminal;
 - establishing the conference call between the parties belonging to the group.
2. A method according to claim 1, characterized in that the establishment of the conference call comprises the step of adding each terminating party of the group to the conference call to be established.
3. A method according to claim 2, characterized in that the adding step comprises the steps of:
- a) calling the first terminating party;
 - b) starting a time-out countdown for stopping the call to the first terminating party, if first terminating party fails to answer within the timeout period;
 - c) connecting the first terminating party and the originating party to the conference call in response to the first terminating party answering the call;
 - d) calling the next terminating party;
 - e) starting the time-out countdown for stopping the call to the next terminating party, if the next terminating party fails to answer within the timeout period;
 - f) connecting the next terminating party to the conference call in response to the next terminating party answering the call;
 - g) checking if there are any terminating parties left for calling; and
 - h) repeating steps d) to g) if there is a terminating party left to be called.

4. A method according to claim 3, characterized in that step a) comprises the step of applying a ringback to the originating party, and step c) comprises the step of closing the ringback when the first terminating party answers the call;

5 5. A method according to claim 3 or 4, characterized in that between steps b) and c) the method comprises the steps of

- calling another terminating party if the first terminating party fails to answer the call, and
- releasing the first terminating party who fails to answer the call within the timeout period.

10 6. A method according to claim 3, 4, or 5, characterized in that step f) comprises the step of applying a joining tone when the next terminating party answers the call.

15 7. A method according to claim 3, 4, 5, or 6, characterized in that between steps e) and f) the method comprises the steps of

- calling another terminating party if said next terminating party fails to answer the call, and
- releasing the next terminating party who fails to answer the call within the timeout period.

20 8. A method according to any of claims 1 to 7, characterized in that the method further comprises the step of applying a special tone when the conference call is established.

25 9. A method according to claim 1, characterized in that for generating a group of the terminating parties, which is stored to the memory, a create function is provided, which the originating party chooses when creating a new group, the create function comprising the steps of:

- adding a terminating party to the group;
- checking if there are any terminating parties left to be added;
- repeating the adding step if there is any terminating party left to be added; and
- saving the group when every terminating party has been added to the group.

30 10. A method according to claim 1, characterized in that a function for modifying a group of the terminating parties is provided.

35 11. A method according to claim 1, characterized in that a function for deleting a group of the terminating parties is provided.

12. A method for creating a group of parties in a party's terminal in a conference call arrangement, characterized in that the method comprises the steps of :
- 5 - choosing a mode of creating the group of terminating parties in an originating party's terminal,
 - entering contact information of each terminating party desired to be added to the group;
 - entering identification information of the group, and
 - saving the group.
- 10 13. A method according to claim 12, characterized in that the identification of the saved group is used for a selection of a conference call group.
14. An arrangement for establishing a conference call between an originating party and at least one of a plurality of terminating parties in a tele-
- 15 communications network, which comprises a conference call service element and phone terminals, each terminal being party specific, characterized in that the arrangement comprises:
- a conference function means in at least one phone terminal for doing tasks needed for establishing the conference call;
 - 20 - first means in the conference function means for selecting one group from among predetermined groups of the terminating parties; and
 - switching control means for controlling switching in a relevant cross-connection field as a response to the selection in the
 - 25 first means, for automatically establishing the conference call between the originating party and the terminating parties of the selected group.
15. An arrangement according to claim 14, characterized in that the switching control means are adapted to add each terminating party
- 30 of the group to the conference call to be established.
16. An arrangement according to claim 15, characterized in that the switching control means comprises:
- i) means for calling each terminating party;
 - j) means for starting a time-out countdown for stopping the call
 - 35 to a terminating party, if the terminating party fails to answer;

k) means for directing the making of a connection for each party to the conference call;

l) means for checking if there are any terminating parties left for calling; and

5 m) means for repeating the establishment functions in means j) to l) if there is any terminating party left as a response from the checking means.

17. An arrangement according to claim 16, characterized in that the switching control means further comprises means for applying a
10 ringback to the originating party, and means for closing the ringback when the terminating party answers the call.

18. An arrangement according to claim 16 or 17, characterized in that the switching control means further comprises means for releasing any terminating party who fails to answer the call.

15 19. An arrangement according to claim 16, 17, or 18, characterized in that the switching control means further comprises means for applying a joining tone when the next terminating party answers the call after at least one terminating party has been connected to the conference call;

20 20. An arrangement according to claim 14, characterized in that the conference function means further contains a creation function for creating the group, which function the originating party chooses when creating a new group, the create function comprising:

- means for adding each terminating party to the group;
- 25 - means for checking if there are any terminating parties left to be added;
- means for repeating the actions of the switching control means and the checking means if there are any terminating parties left to be added; and
- 30 - means for saving the group when every terminating party has been added to the group.

21. An arrangement according to claim 14, characterized in that the conference function means further comprises means for modifying a predetermined group.

22. An arrangement according to claim 14, characterized in that the conference function means further comprises means for deleting a predetermined group.

5 23. An arrangement according to claim 14, characterized in that the switching control means are situated in at least one phone terminal.

24. A phone terminal, characterized by comprising means for making a conference call, the means comprising:

- 10 - a conference function means for doing tasks needed for establishing the conference call;
- first means in the conference function means for selecting one group from among predetermined groups of terminating parties; and
- 15 - second means for automatically making the conference call as a response to the selection in the first means.

25. A phone terminal according to claim 24, characterized in that the conference function means comprises a creation function means for creating the group, which function the originating party chooses when creating a new group, the create function means comprising:

- 20 - means for adding each terminating party to the group;
- means for checking if there are any terminating parties left to be added;
- means for repeating the actions of the adding means and the checking means if there are any terminating parties left to be added; and
- 25 - means for saving the group when every terminating party has been added to the group.

26. A phone terminal according to claim 25, characterized in that the conference function means further comprises means for
30 modifying a predetermined group.

27. A phone terminal according to claim 25, characterized in that the conference function means further comprises means for deleting a predetermined group.

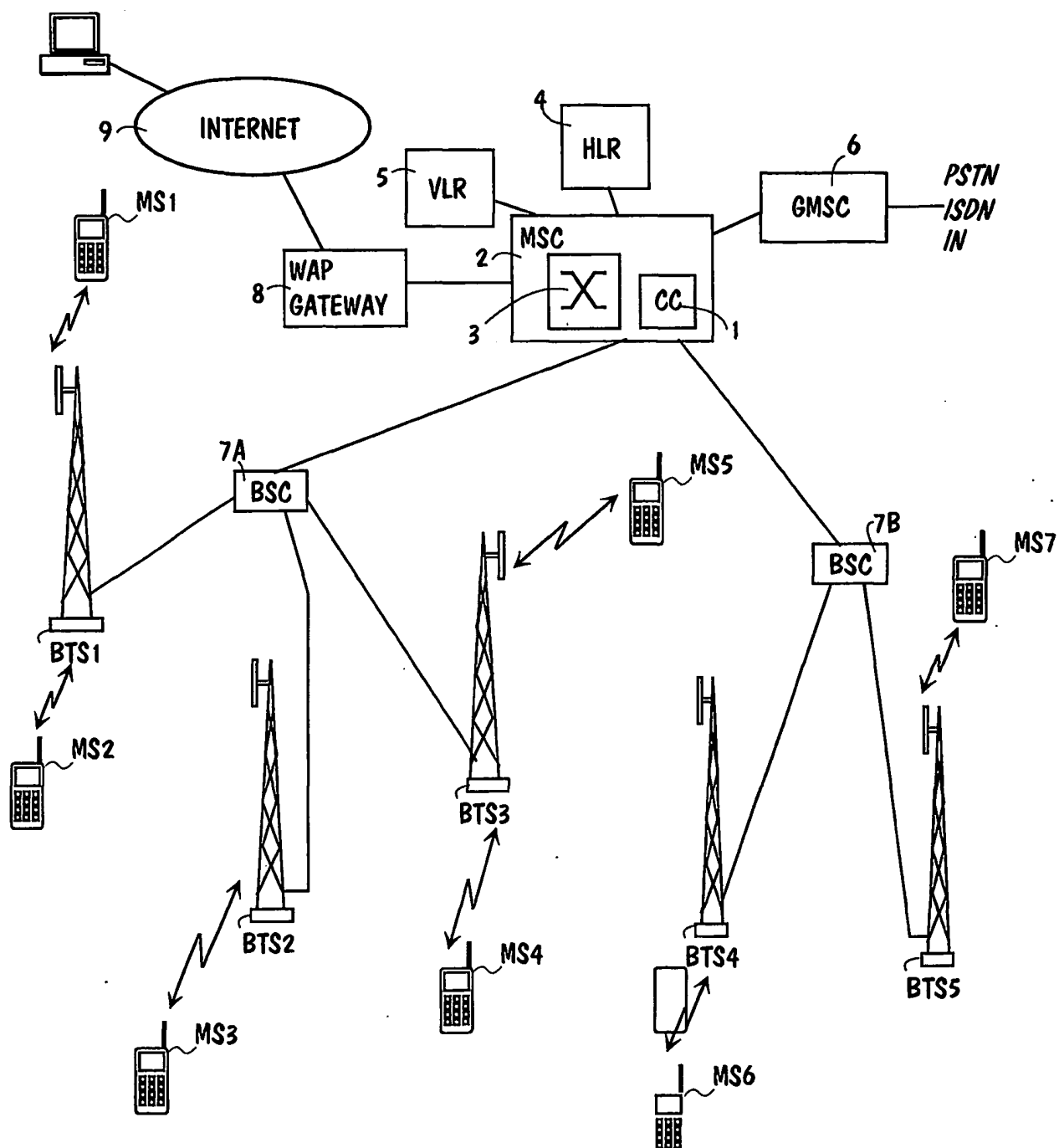


FIG. 1

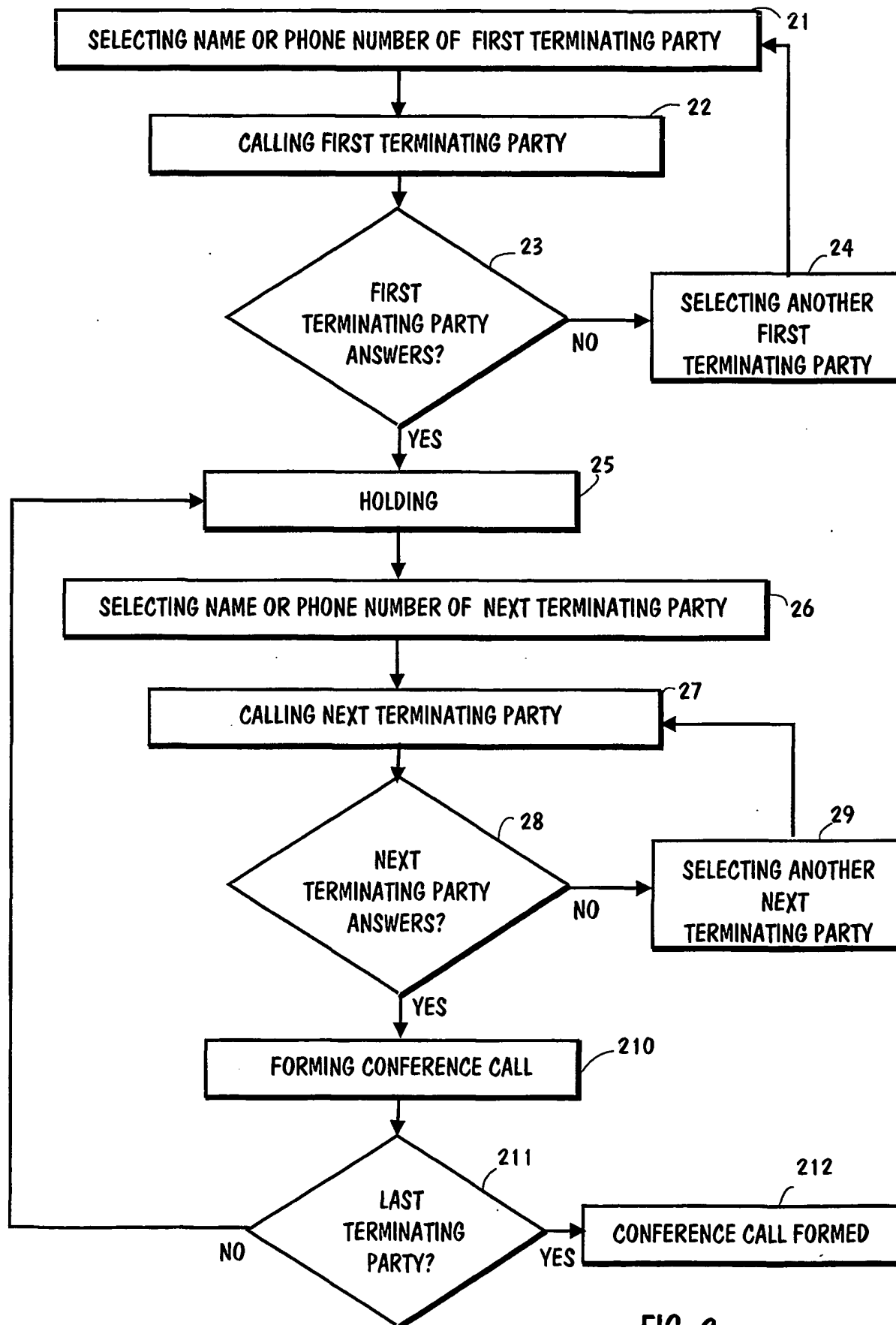


FIG. 2

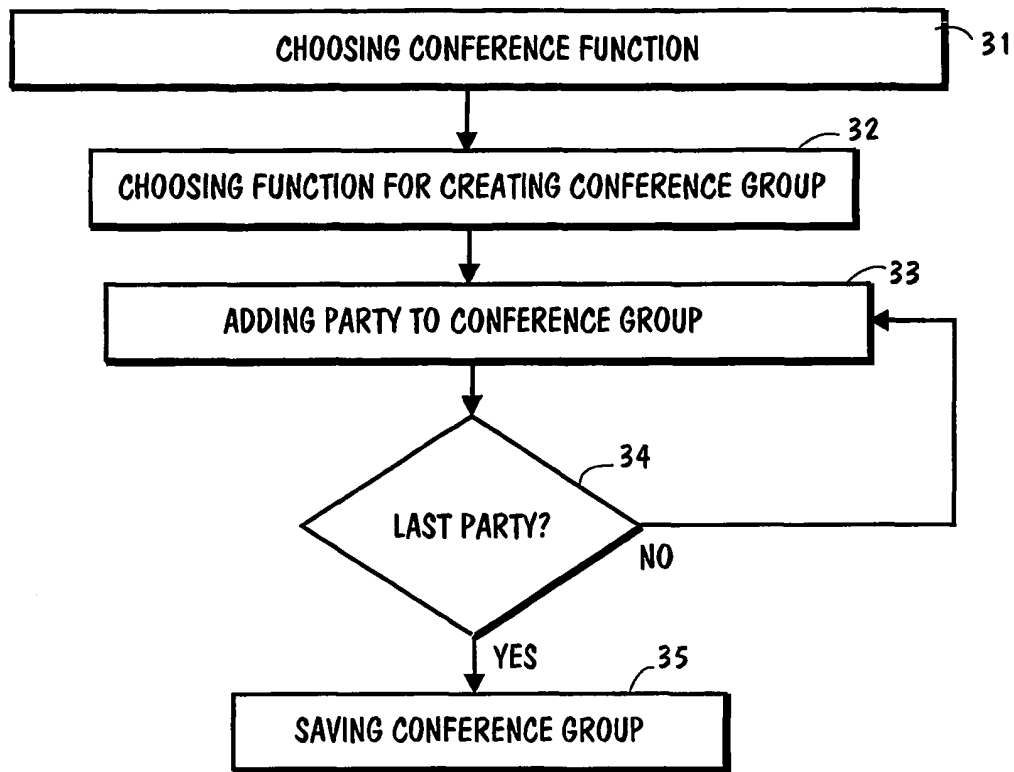


FIG. 3

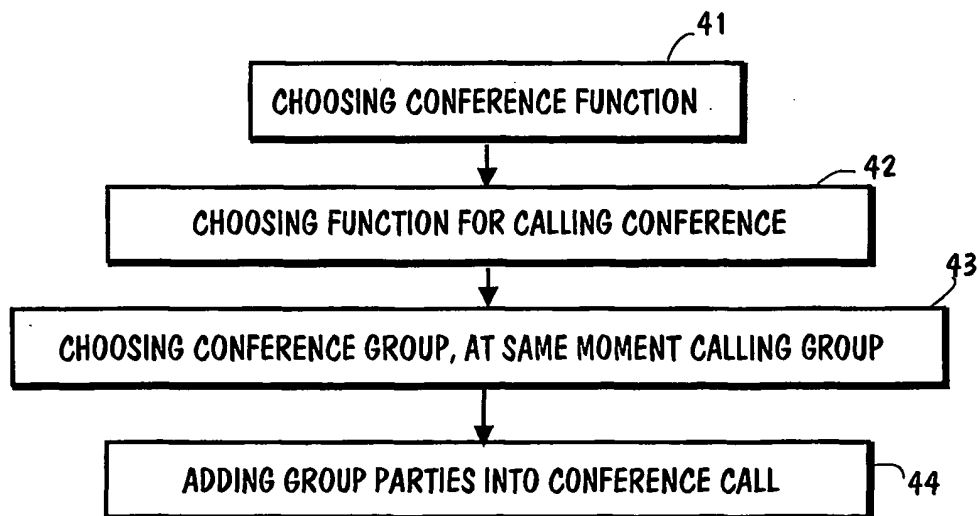


FIG. 4

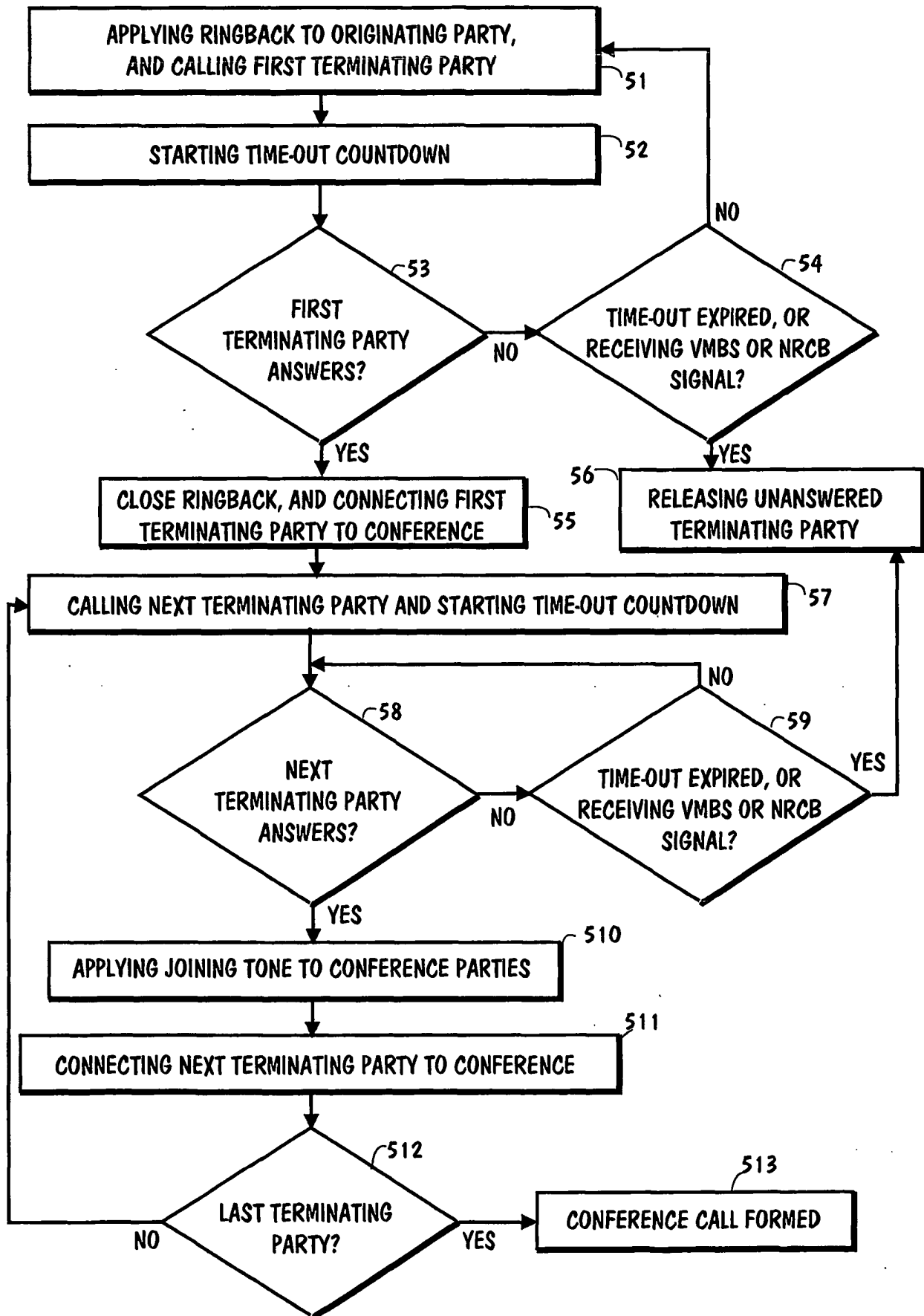


FIG. 5

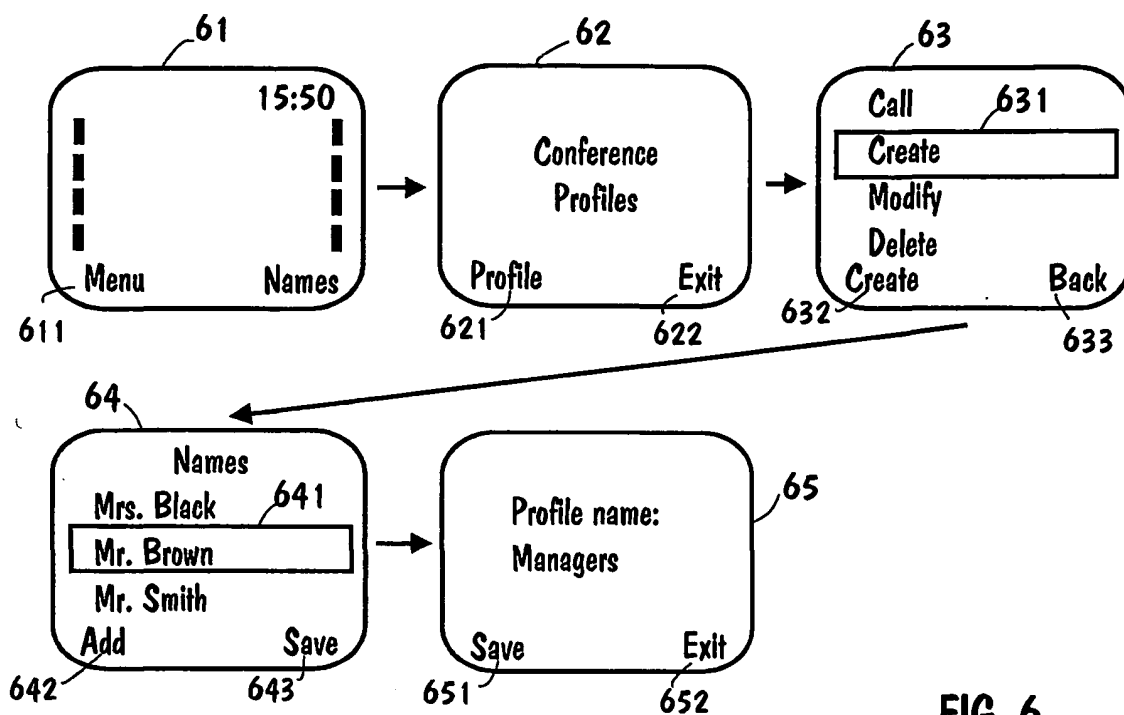


FIG. 6

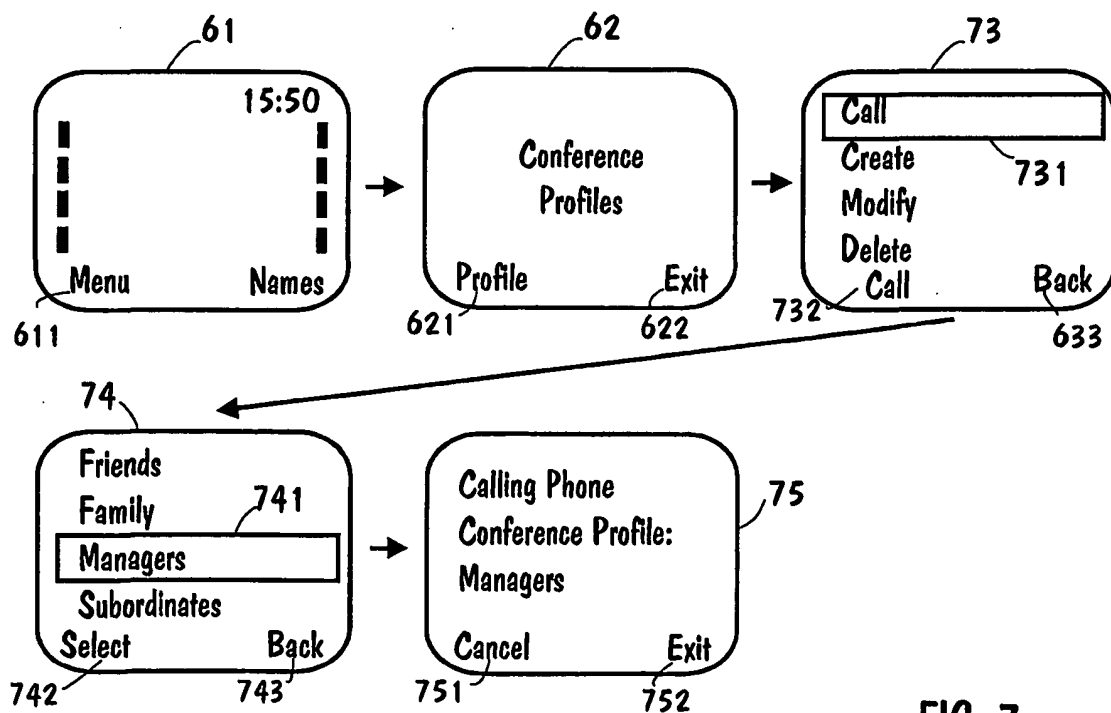


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 01/00389

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04M 3/56, H04Q 7/38 // H04M 1/275

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO INTERNAL, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0954156 A2 (NOKIA MOBILE PHONES LTD.), 3 November 1999 (03.11.99), column 2, line 6 - line 37; column 4, line 20 - line 58, figure 3 --	1-27
X	WO 0038400 A1 (ERICSSON INC.), 29 June 2000 (29.06.00), page 2, line 16 - page 3, line 10; page 4, line 18 - page 5, line 14, figure 2 --	1-27
Y	US 6128381 A (J. TOMAS HOLMSTRÖM ET AL), 3 October 2000 (03.10.00), column 2, line 26 - line 55; column 3, line 14 - line 21, figure 2 --	1-27

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

28 November 2001

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 01/00389

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Y	EP 0713319 A2 (AT&T CORP.), 22 May 1996 (22.05.96), figure 2, claims 1-2 -- -----	1-27

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